Atlantic Richfield Company

wood.

Appendix 6C

OU-6 ProUCL Software Output Data

Table 6-6 ProUCL outputs

ProUCL outputs: 0-2.5 and 2.5-10 ft bgs depth comparison

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 6:51:38 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Antimony (MG/KG) (0-2.5)

Sample 2 Data: Antimony (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	14	20
Number of Detect Data	20	15
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	2.6	2.9
Percent Non-detects	41.18%	57.14%
Minimum Detect	0.2	0.076
Maximum Detect	12	7.5
Mean of Detects	2.257	1.938
Median of Detects	1.65	1.6
SD of Detects	2.562	1.956
KM Mean	1.433	0.877
KM SD	2.175	1.553

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.585
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.113

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 6:57:57 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Chromium, Total (MG/KG) (0-2.5)

Sample 2 Data: Chromium, Total (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	0	0
Number of Detect Data	34	35
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	1.4	1.8
Maximum Detect	40	38
Mean of Detects	18.35	16.47
Median of Detects	19	19
SD of Detects	10.08	10.7
KM Mean	18.35	16.47
KM SD	10.08	10.7

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.384
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.701

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:00:25 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Copper (MG/KG) (0-2.5)

Sample 2 Data: Copper (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	0	0
Number of Detect Data	34	35
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	5	6.3
Maximum Detect	3100	2800
Mean of Detects	1047	840.5
Median of Detects	920	860
SD of Detects	667.5	639.6
KM Mean	1047	840.5
KM SD	667.5	639.6

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.008
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.313

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:02:51 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Magnesium (MG/KG) (0-2.5)

Sample 2 Data: Magnesium (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	0	0
Number of Detect Data	34	35
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	1600	1800
Maximum Detect	12000	12000
Mean of Detects	5400	5083
Median of Detects	5650	5000
SD of Detects	2059	2242
KM Mean	5400	5083
KM SD	2059	2242

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.66
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.509

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:04:20 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Mercury (MG/KG) (0-2.5)

Sample 2 Data: Mercury (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	1	4
Number of Detect Data	33	31
Minimum Non-Detect	1.4000E-4	1.4000E-4
Maximum Non-Detect	1.4000E-4	1.5000E-4
Percent Non-detects	2.94%	11.43%
Minimum Detect	0.0012	0.001
Maximum Detect	0.93	0.8
Mean of Detects	0.234	0.198
Median of Detects	0.18	0.16
SD of Detects	0.23	0.175
KM Mean	0.228	0.175
KM SD	0.226	0.174

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.912
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.362

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:05:08 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Molybdenum (MG/KG) (0-2.5)

Sample 2 Data: Molybdenum (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	8	8
Number of Detect Data	26	27
Minimum Non-Detect	1.9	1.2
Maximum Non-Detect	3.9	3.5
Percent Non-detects	23.53%	22.86%
Minimum Detect	0.072	0.054
Maximum Detect	6.5	11
Mean of Detects	3.363	2.591
Median of Detects	3.5	2.4
SD of Detects	1.76	2.377
KM Mean	2.9	2.198
KM SD	1.842	2.224

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	1.766
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0774

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:15:15 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Selenium (MG/KG) (0-2.5)

Sample 2 Data: Selenium (MG/KG) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	34	35
Number of Non-Detects	2	6
Number of Detect Data	32	29
Minimum Non-Detect	0.17	0.16
Maximum Non-Detect	0.17	0.18
Percent Non-detects	5.88%	17.14%
Minimum Detect	0.19	0.19
Maximum Detect	7.7	13
Mean of Detects	3.315	3.63
Median of Detects	3.15	3
SD of Detects	1.767	2.436
KM Mean	3.13	3.035
KM SD	1.843	2.541

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	0.456
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.648

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:22:29 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Radium-226 (PCI/G) (0-2.5)

Sample 2 Data: Radium-226 (PCI/G) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	26	24
Number of Non-Detects	0	0
Number of Detect Data	26	24
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	1.42	1.44
Maximum Detect	8.48	8.76
Mean of Detects	3.125	3.725
Median of Detects	2.97	3.47
SD of Detects	1.434	1.736
KM Mean	3.125	3.725
KM SD	1.434	1.736

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	-1.709
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0875

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.18/11/2020 7:23:30 AM
From File	OU-6 eval_metals_ProUCL input.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Radium-228 (PCI/G) (0-2.5)

Sample 2 Data: Radium-228 (PCI/G) (2.5-10)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	26	24
Number of Non-Detects	1	0
Number of Detect Data	25	24
Minimum Non-Detect	1	N/A
Maximum Non-Detect	1	N/A
Percent Non-detects	3.85%	0.00%
Minimum Detect	0.666	0.61
Maximum Detect	2.3	1.61
Mean of Detects	1.163	0.948
Median of Detects	1.08	0.914
SD of Detects	0.366	0.25
KM Mean	1.15	0.948
KM SD	0.357	0.25

Sample 1 vs Sample 2 Gehan Test

H0: Mean of Sample 1 = Mean of background

Gehan z Test Value	2.149
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0316

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 <> Sample 2

P-Value < alpha (0.05)